

ENGINEERING STANDARD

OAK RIDGE, TENNESSEE

PIPE HANGERS - GENERAL NOTES

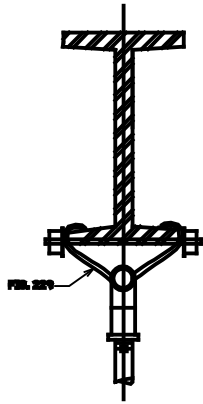
NUMBER	ES-4.5-2
DATE	9-6-73
REVISED	12-5-95
PAGE	1 OF 14

1. STRUCTURAL STEEL SHALL CONFORM TO ASTM A-283 AND A-306. PIPE FOR COLUMNS SHALL BE CARBON STEEL, SCHEDULE 40, CONFORMING TO ASTM A-53, GRADE A.
2. THE AISC SPECIFICATION FOR THE DESIGN, FABRICATION, AND ERECTION OF STRUCTURAL STEEL FOR BUILDINGS AND THE AISC CODE OF STANDARD PRACTICE SHALL GOVERN THIS WORK. BOLTED CONNECTIONS FOR STRUCTURAL JOINTS SHALL BE MADE USING ASTM A-325 BOLTS.
3. WELDING SHALL BE IN ACCORDANCE WITH THE AMERICAN WELDING SOCIETY STANDARD CODE FOR ARC AND GAS WELDING IN BUILDING CONSTRUCTION.
4. ALL METAL SURFACES SHALL BE PAINTED IN ACCORDANCE WITH TECHNICAL SPECIFICATION A-4.3, SUBSECTION 4.
5. CONCRETE SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 3000 PSI AT 28 DAYS AND SHALL BE OBTAINED FROM AN APPROVED SOURCE.
6. THE FOLLOWING SET OF PIPE HANGER STANDARDS HAS BEEN DEVELOPED TO MEET THE REQUIREMENTS FOR ORDINARY PIPING SYSTEMS. FOR THE SAKE OF SIMPLICITY, PIPE SIZES, LOADS, SPANS AND LENGTHS OF SUPPORTS HAVE BEEN LIMITED. PIPE HANGERS FOR CONDITIONS NOT COVERED SHOULD BE CUSTOM DESIGNED AND PATTERNED AS FAR AS POSSIBLE AFTER THESE STANDARDS.
7. IT IS THE PURPOSE OF THE STANDARDS TO PROVIDE A UNIFORM AND PRE-ENGINEERED SYSTEM FOR HANGING PIPE AND TO ELIMINATE THE NECESSITY OF COMPLETELY DETAILING HANGERS ON THE DRAWINGS.
8. BY SELECTING THE PROPER COMPONENTS FROM THE VARIOUS STANDARDS, THE DESIRED HANGER OR SUPPORT MAY BE ASSEMBLED TO SUIT DESIGN REQUIREMENTS.
9. THE MAXIMUM LOADS GIVEN IN THE STANDARDS ARE FOR THE HANGER COMPONENTS ONLY, IN EVERY CASE, THE SUPPORTING STRUCTURES SUCH AS WOODEN JOISTS, STEEL AND CONCRETE BEAMS, FLOOR AND WALLS MUST BE CHECKED FOR STRENGTH BEFORE ADDING ANY ADDITIONAL HANGER LOAD.
10. TO USE THE STANDARDS, THE DESIGNER SHOULD INDICATE ON THE PIPING DRAWINGS THE LOCATION AND SPACING OF HANGERS, GIVING EACH A NUMBER. HANGERS WHICH ARE ALIKE SHOULD HAVE THE SAME NUMBER. THE SYMBOL FOR A HANGER MAY BE A SHORT HEAVY LINE DRAWN AT RIGHT-ANGLES TO THE PIPING.

APPROVED BY

Charles Garren

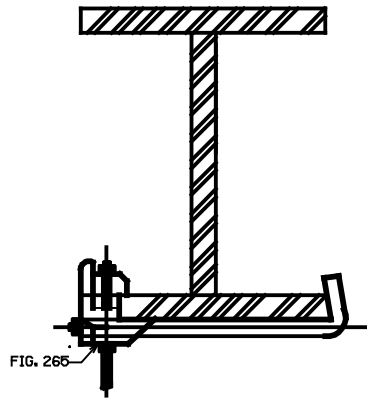
PIPE HANGERS – BUILDING CONNECTIONS – BC SERIES



BC-1

FOR PIPE SIZES 8" AND SMALLER
USE ON AM. STD. I BEAMS AND
WF BEAMS WHERE FLANGE
WIDTH IS 2 3/4" TO 7" AND
THICKNESS .60" MAX.

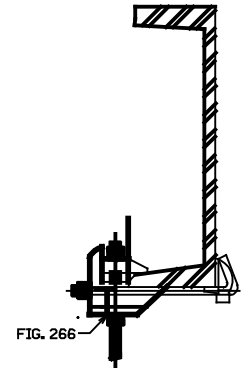
ADADA



BC-2

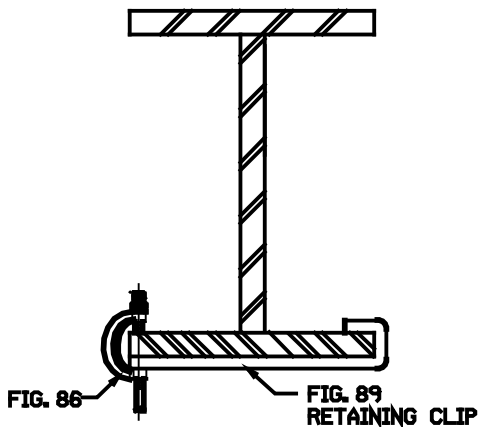
FOR PIPE SIZES 8" AND SMALLER
USE ON AM. STD. I BEAMS WF BEAMS,
AND ANGLE ROOF TRUSSES WHERE
THE FLANGE THICKNESS IS NOT LESS
THAN 5/16" AND NOT OVER 1 3/4"

KKKKKK



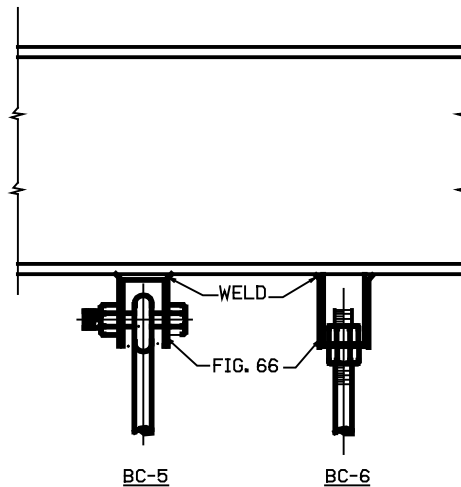
BC-3

FOR PIPE SIZES 8" AND SMALLER.
USE WITH CHANNELS ONLY THICKNESS
OF FLANGE NOT TO EXCEED 1 3/4".



BC-4

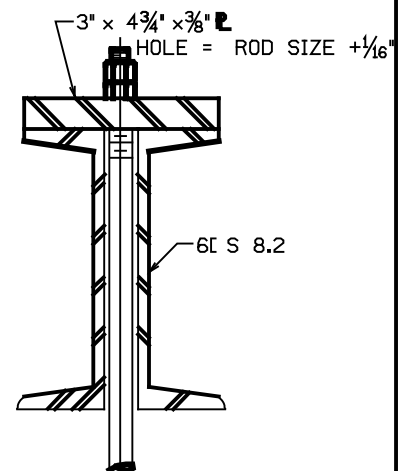
FOR PIPE SIZES 6" AND SMALLER
USE ON AN. STD. I BEAMS AND
WF BEAMS



BC-5

BC-6

PIPE SIZE UNLIMITED
MAY BE ATTACHED TO
ANY SUITABLE STRUCTURAL
STEEL

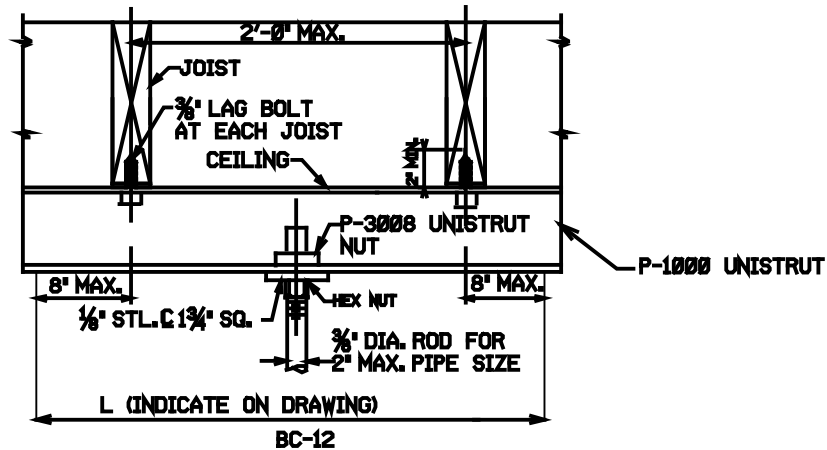
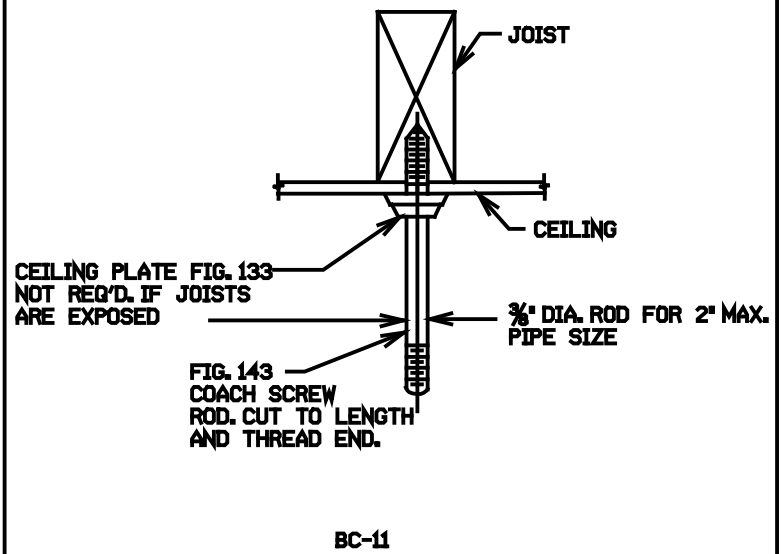
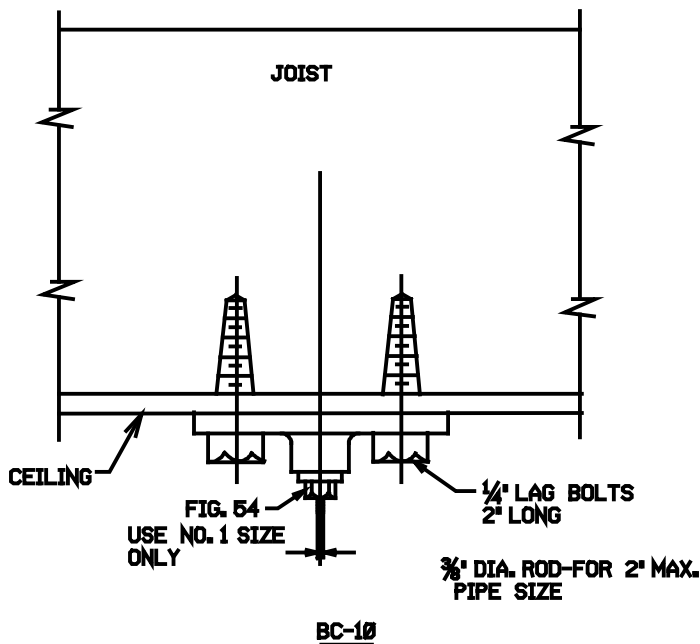
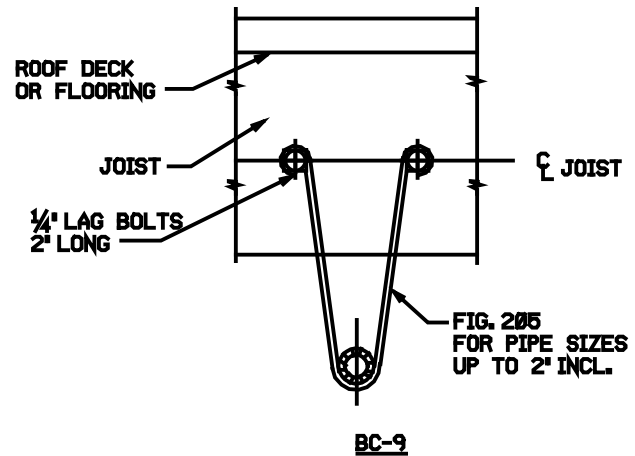
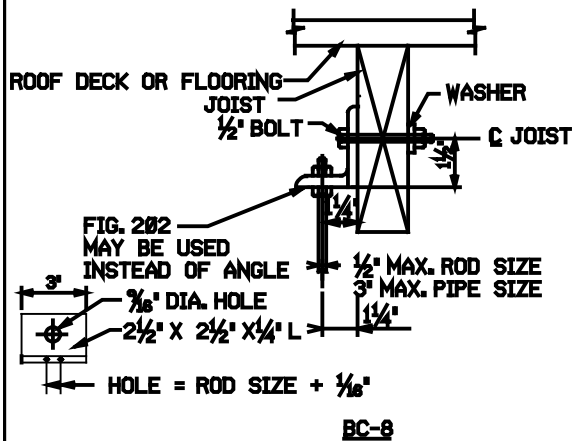


BC-7

FOR PIPE SIZES 16" AND SMALLER.

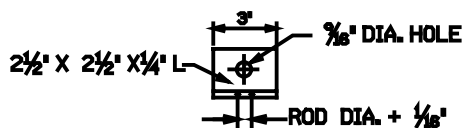
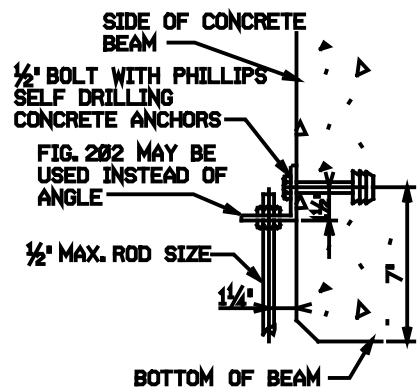
NOTE: ALL FIGURE NUMBERS REFER TO GRINNELL CO. HANGERS

PIPE HANGERS - BUILDING CONNECTIONS - BC SERIES



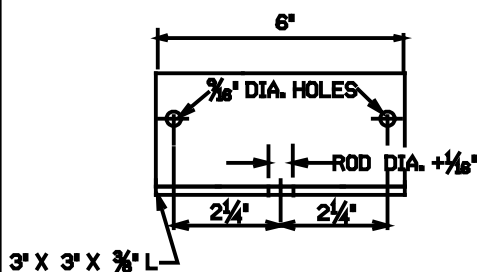
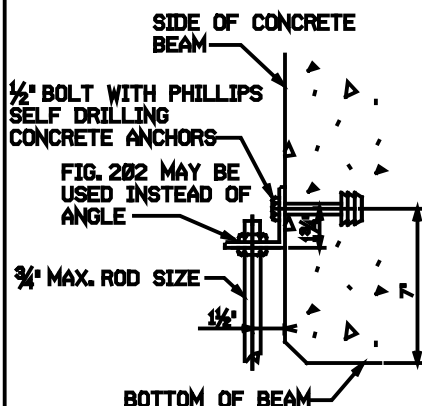
NOTE: ALL FIGURE NUMBERS REFER TO GRINNELL CO. HANGERS

PIPE HANGERS - BUILDING CONNECTIONS - BC SERIES



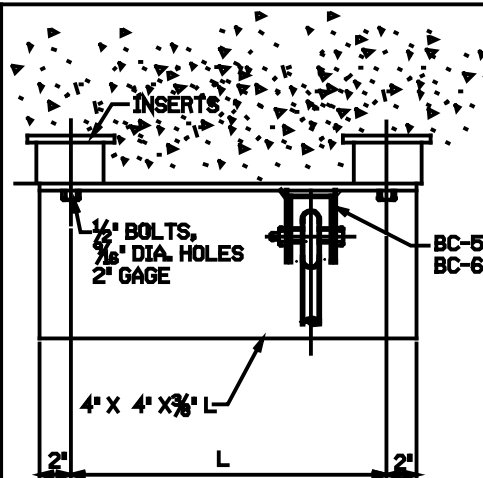
MAX. LOAD 300*

BC-13



MAX. LOAD 800*

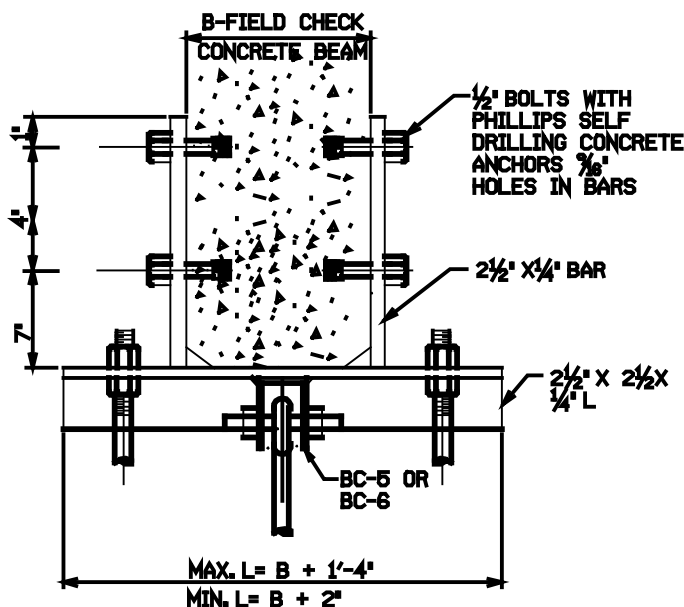
BC-14



FOR EXISTING INSERTS TEST WITH 1 1/2 TIMES THE TOTAL LOAD.
FOR NEW INSERTS DESIGN FOR 1 1/2 TIMES THE MAX. LOAD

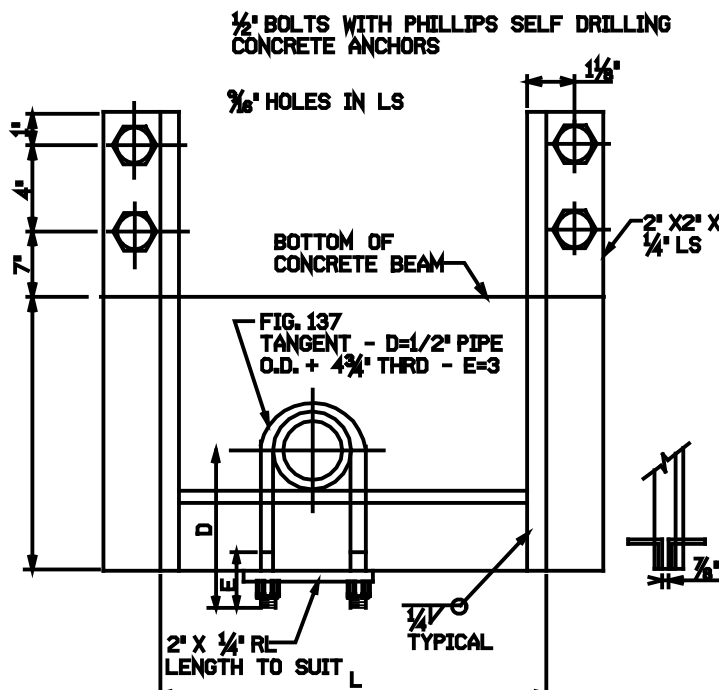
L	MAX. LOAD
50" OR LESS	2400*
51" TO 70"	1700*
71" TO 90"	1300*

BC-15



MAX. TOTAL LOAD 2000*
NO LIMIT ON ROD SIZE

BC - 16

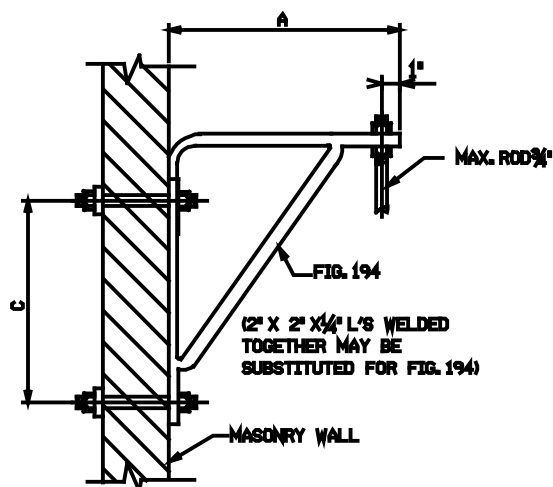


L	ANGLE SIZE	MAX. LOAD LBS
24" OR LESS	2" X 2" X 1/4"	1660
25" TO 36"	2 1/2" X 2 1/2" X 1/4"	1740
25" TO 36"	2 1/2" X 2 1/2" X 1/4"	1950

BC - 17

NOTE: ALL FIGURE NUMBERS REFER TO GRINNELL CO. HANGERS

PIPE HANGERS - BUILDING CONNECTIONS - BC SERIES

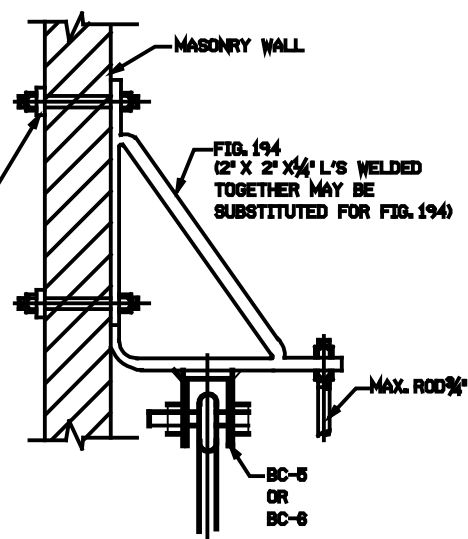


MAX. LOAD 1500#

BC-18

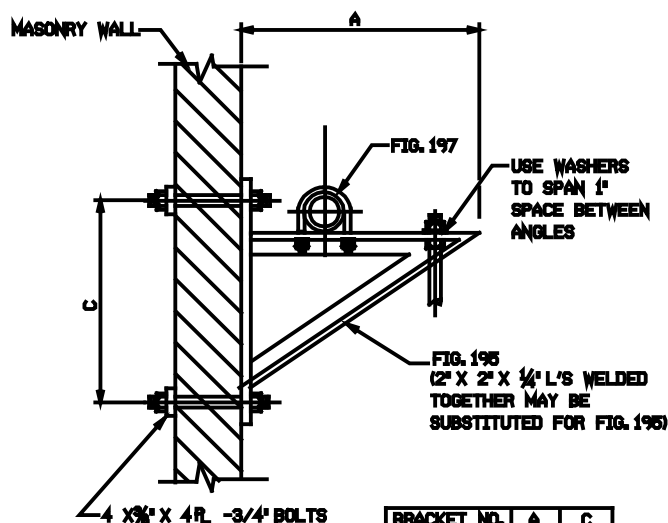
BRACKET NO.	A	C
1	9"	8 1/2"
2	13"	10 1/2"
3	19"	16 1/2"

3" X 1/4" X 3" R-1/2" BOLTS
TYPICAL FOR
BC-18 & BC-19



MAX. LOAD 750#

BC-19



MAX. LOAD 1500#

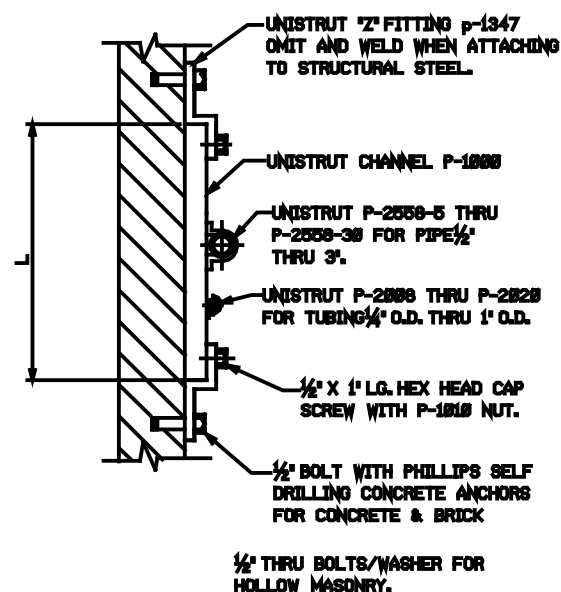
BC-20

BRACKET NO.	A	C
0	12"	15 1/2"
1	18"	21 1/2"
2	24"	27 1/2"

USE WASHERS
TO SPAN 1"
SPACE BETWEEN
ANGLES

FIG. 195
(2" X 2" X 1/4" L'S WELDED
TOGETHER MAY BE
SUBSTITUTED FOR FIG. 195)

MASONRY WALL



1/2" THRU BOLTS/WASHER FOR
HOLLOW MASONRY.

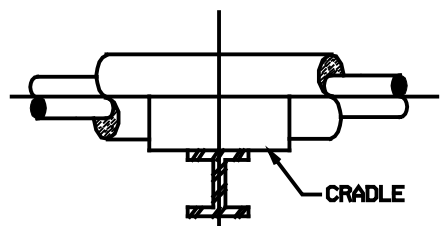
1/2" X 2 1/2" LG. LAG SCREWS
FOR WOOD TIMBERS

MAX. LOAD 1500#

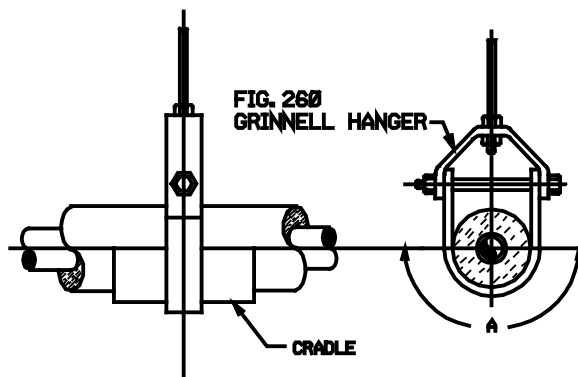
BC-21

NOTE: ALL FIGURE NUMBERS REFER TO GRINNELL CO. HANGERS

PIPE HANGERS - PIPE CONNECTIONS FOR COLD LINES ONLY - PC SERIES



SLIDING TYPE
PC-8



CLEVIS TYPE
PC-9

CRADLES FOR USE WITH CELLULAR GLASS PIPE INSULATION

PIPE SIZE	CRADLE LENGTH	CRADLE THICKNESS
1/2" TO 2 1/2"	8"	16 GA.
3" TO 10"	10"	3/8"
12"	12"	3/8"
14"	14"	1/4"
16"	16"	1/4"
18"	18"	5/16"
20"	20"	5/16"
24"	24"	3/8"

1. MATERIAL FOR CRADLE SHALL BE CARBON STEEL SHEET OR PLATE.
2. A = WIDTH OF CRADLE BEFORE FORMING AND IS EQUAL TO O.D. OF INSULATION X 1.5 FORM TO FIT UNIFORMLY AROUND INSULATION.
3. CRADLE LENGTHS IN TABLE ARE SUITABLE FOR MAXIMUM SPANS OF 25 FEET FOR LONGER SPANS DETERMINE CRADLE LENGTHS FROM THE FOLLOWING FORMULA. CRADLE THICKNESS SHALL BE 3/8" FOR 24" PIPE.

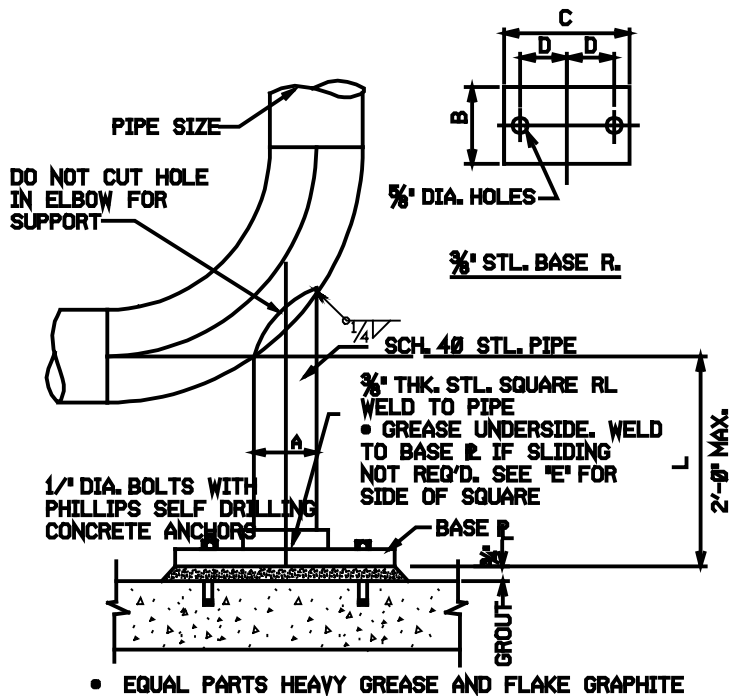
$$L = \frac{WS}{RF} \text{ WHERE}$$

L = LENGTH OF CRADLE.
W = UNIT WT. PER FOOT OF PIPE, WATER AND INSULATION PLUS 10% SAFETY FACTOR.
S = SPAN BETWEEN SUPPORTS IN FEET.
R = 1/2" O.D. OF INSULATION.
F = BEARING VALUE OF INSULATION (30 PSI.)

- FOR CHILLED WATER, BRINE & REFRIGERANT LINES - ALL SIZES.

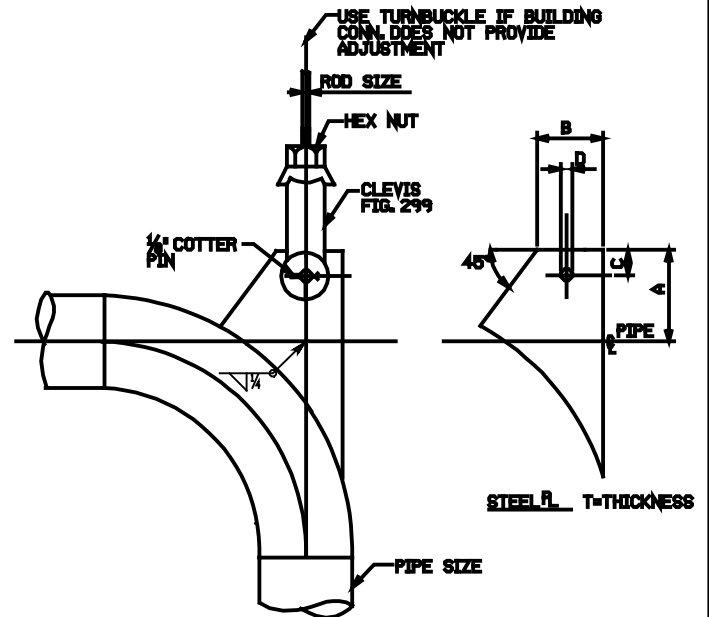
NOTE: ALL FIGURE NUMBERS REFER TO GRINNELL CO. HANGERS

PIPE HANGERS - PIPE CONNECTIONS FOR COLD LINES ONLY - PC SERIES



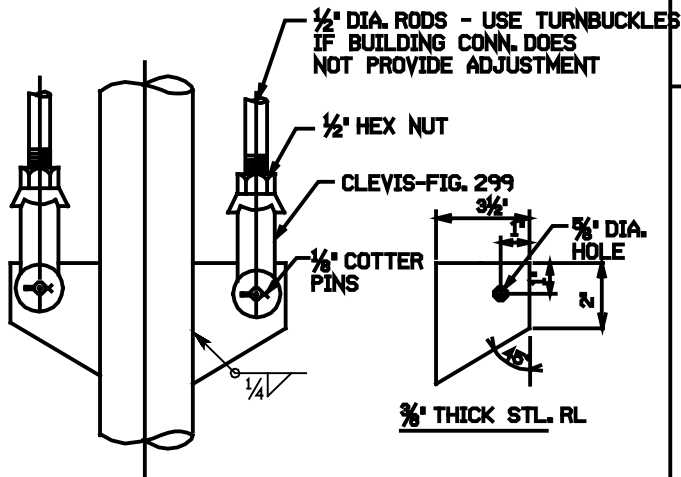
PIPE SIZE	3"	4"	6"	8"	10"	12"
A (NOM.)	1 1/2"	2"	3"	3"	4"	4"
B	3"	3 1/2"	4 1/2"	4 1/2"	5 1/2"	5 1/2"
C	6 1/2"	7"	8"	8"	9"	9"
D	2 1/2"	2 3/4"	3 1/4"	3 1/4"	3 3/4"	3 3/4"
E	2 1/2"	3"	4"	4"	5"	5"

PC-10



PIPE SIZE	3"	4"	6"	8"	10"	12"
A	3 1/2"	3 1/2"	3 1/2"	3 1/2"	4 1/4"	4 1/4"
B	2"	2"	2"	2"	2 1/2"	2 1/2"
C	1"	1"	1"	1"	1 1/4"	1 1/4"
D	1/2"	5/8"	5/8"	3/4"	7/8"	1"
T	3/8"	3/8"	3/8"	3/8"	1/2"	1/2"
ROD SIZE	3/8"	1/2"	1/2"	5/8"	3/4"	7/8"
CLEVIS SIZE	2"	2"	2"	2"	2 1/2"	2 1/2"
ROD TAP	3/8"	1/2"	1/2"	5/8"	3/4"	7/8"
PIN DIA.	3/8"	1/2"	1/2"	5/8"	3/4"	7/8"
PIN HOLE	1/2"	5/8"	5/8"	3/4"	7/8"	1"
GRIP	1/2"	1/2"	1/2"	1/2"	5/8"	5/8"

PC - 11

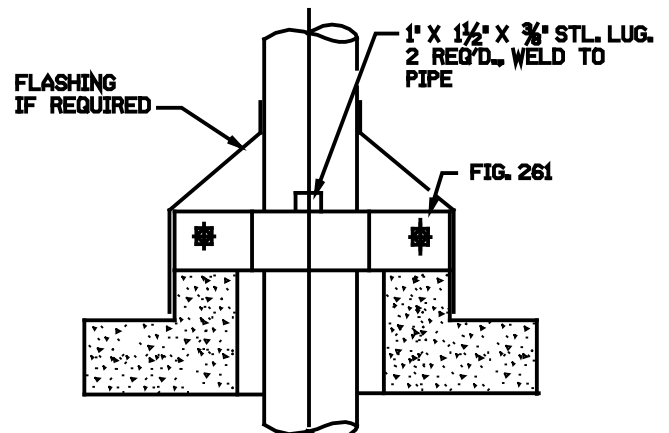


NOTE

USE CLEVIS NO. 2 WITH
1/12" ROD TAP
1/2" DIA. PIN
5/8" DIA. PIN HOLE
1/2" GRIP

FOR PIPE SIZES 3" TO 12" INCL.

PC-12

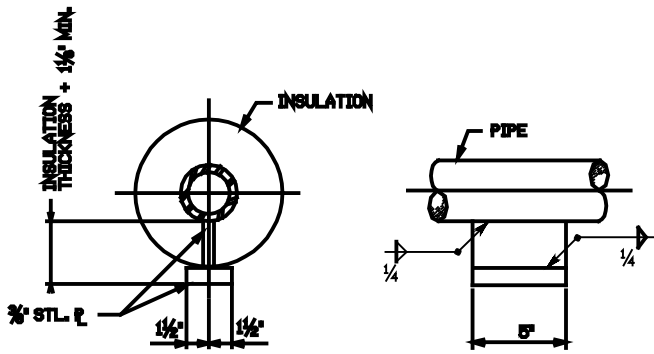


PC - 13

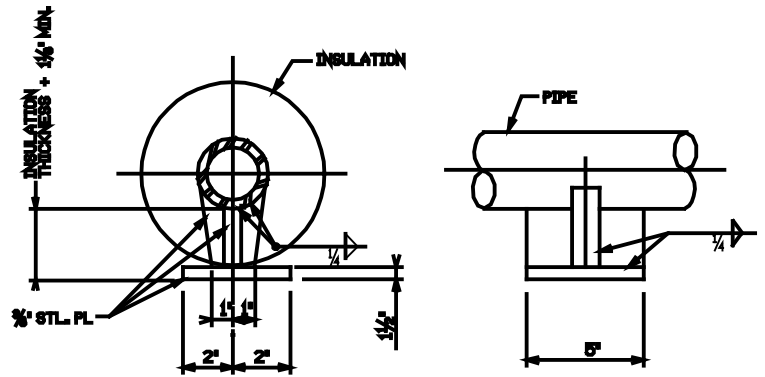
NOTE: ALL FIGURE NUMBERS REFER TO GRINNELL CO. HANGERS

PIPE HANGERS - PIPE ANCHORS AND SLIDES FOR HOT LINES - PA SERIES

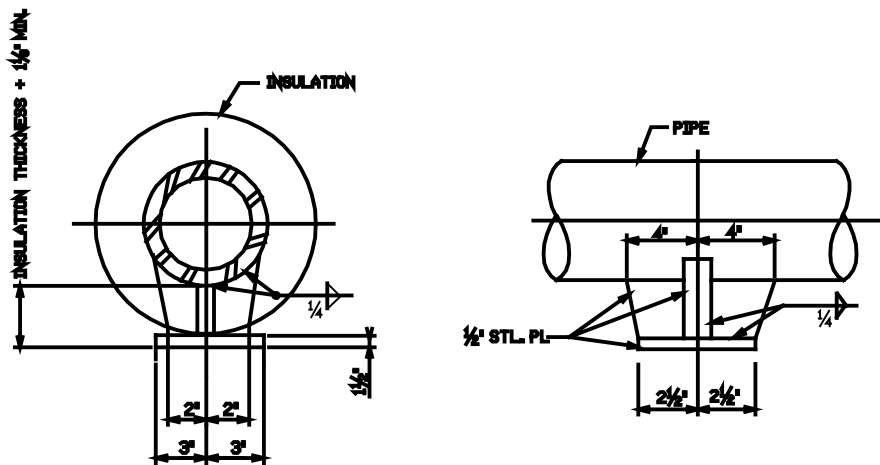
NOTE: WHEN USED AS ANCHOR WELD TO SUPPORT - USE GUIDES WITH SLIDES



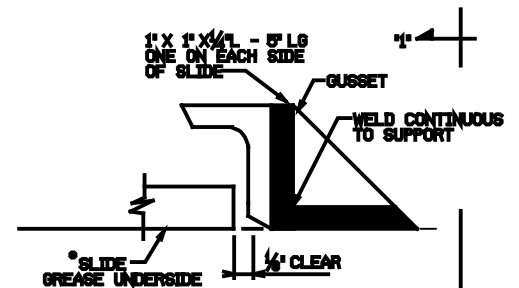
PA-1
FOR PIPE UP TO 2" INCL.



PA-2
FOR PIPE 2 1/2" TO 4" INCL.

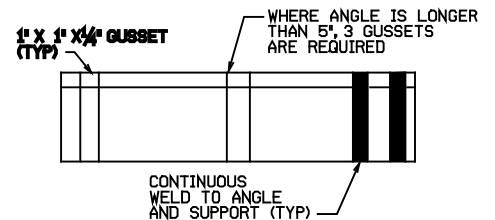


PA-3
FOR PIPE 6" TO 12" INCL.



• EQUAL PARTS HEAVY GREASE
AND FLAKE GRAPHITE

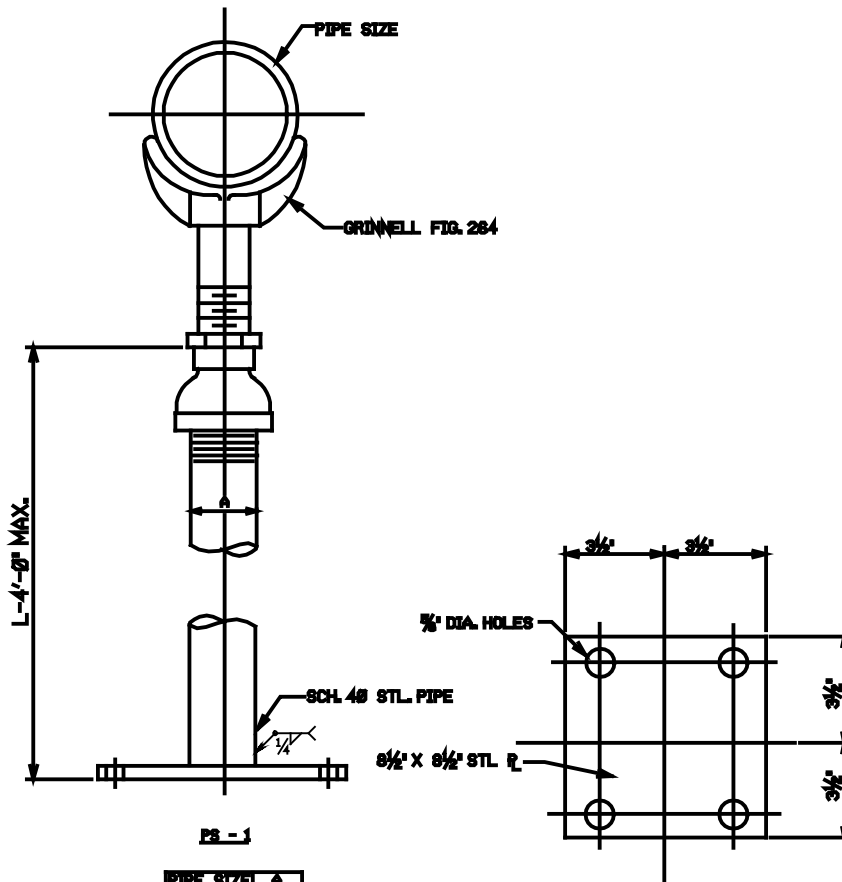
DETAIL OF GUIDE



1" - 1"

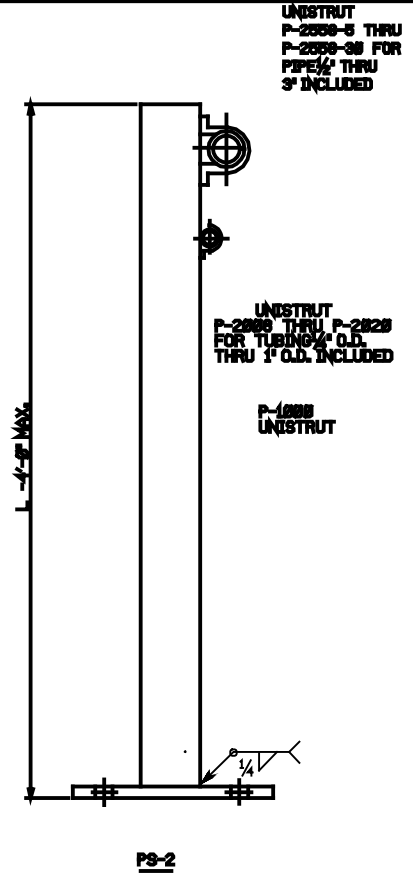
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PIPE HANGERS – BUILDING CONNECTIONS – BC SERIES

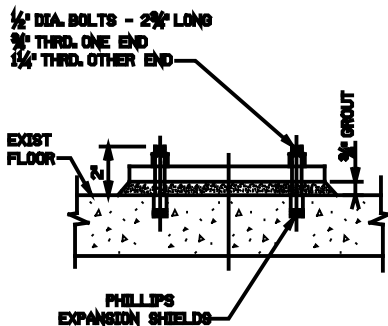


PIPE SIZE	A
2 1/2"	2 1/2"
3"	2 1/2"
4"	2 1/2"
6"	3"
8"	3"
10"	3"
12"	3"

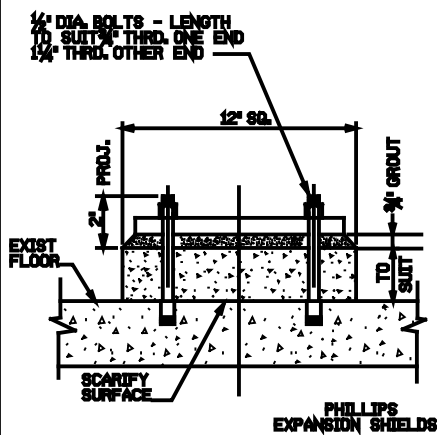
BASE PLATE
FOR PS-1 & PS-2



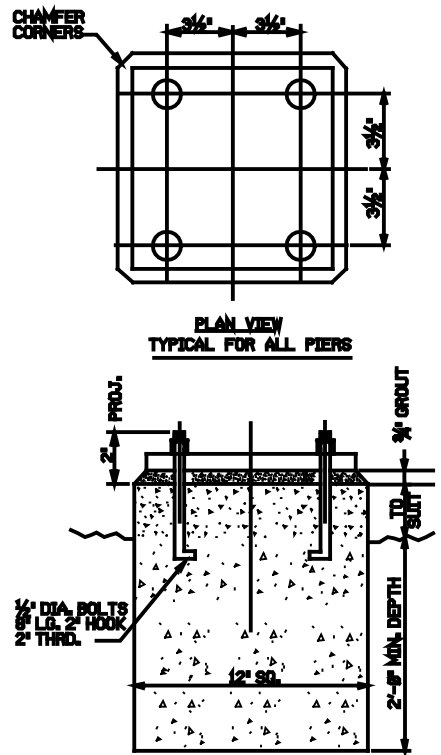
PS-2



PIER - A



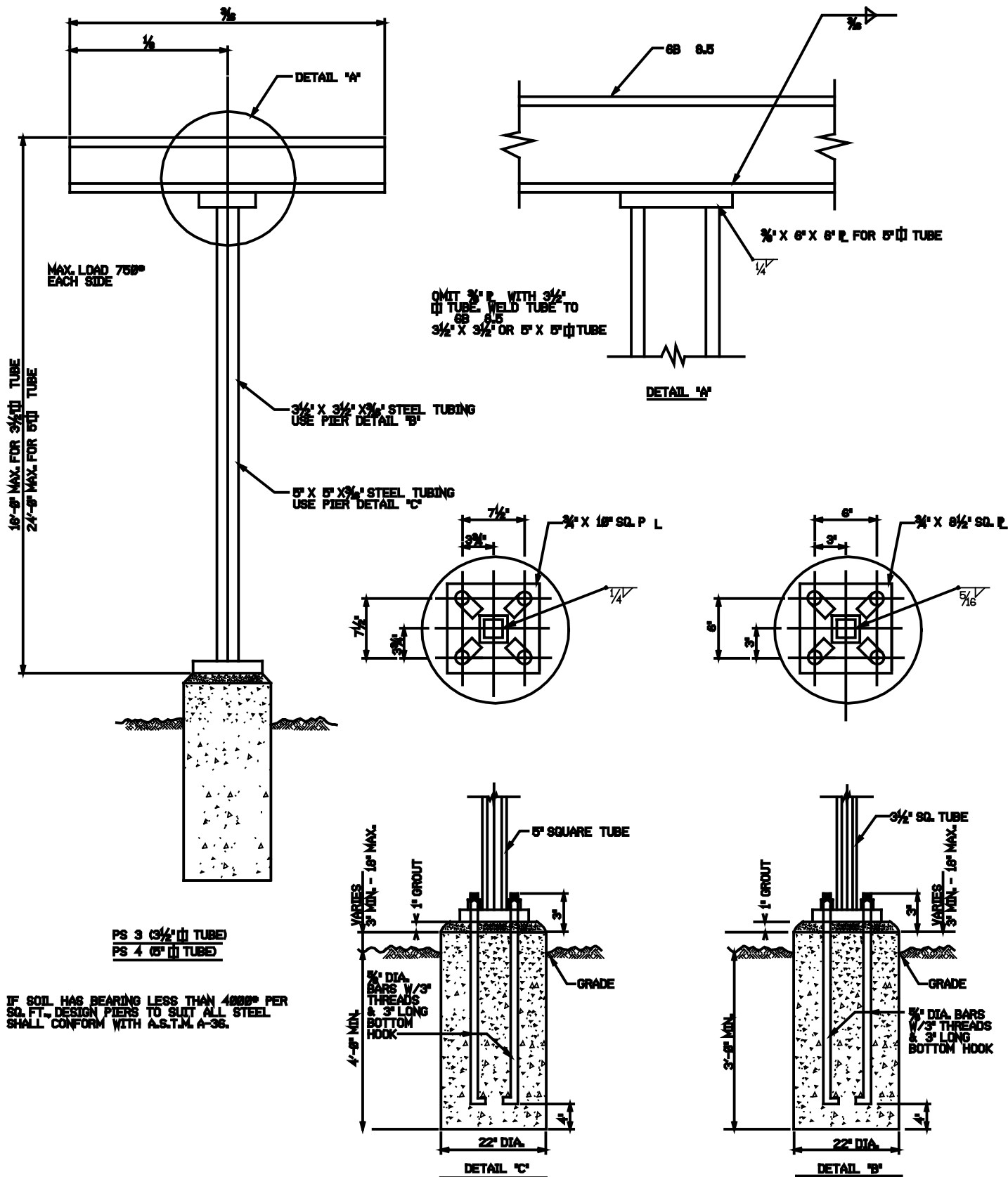
PIER - B



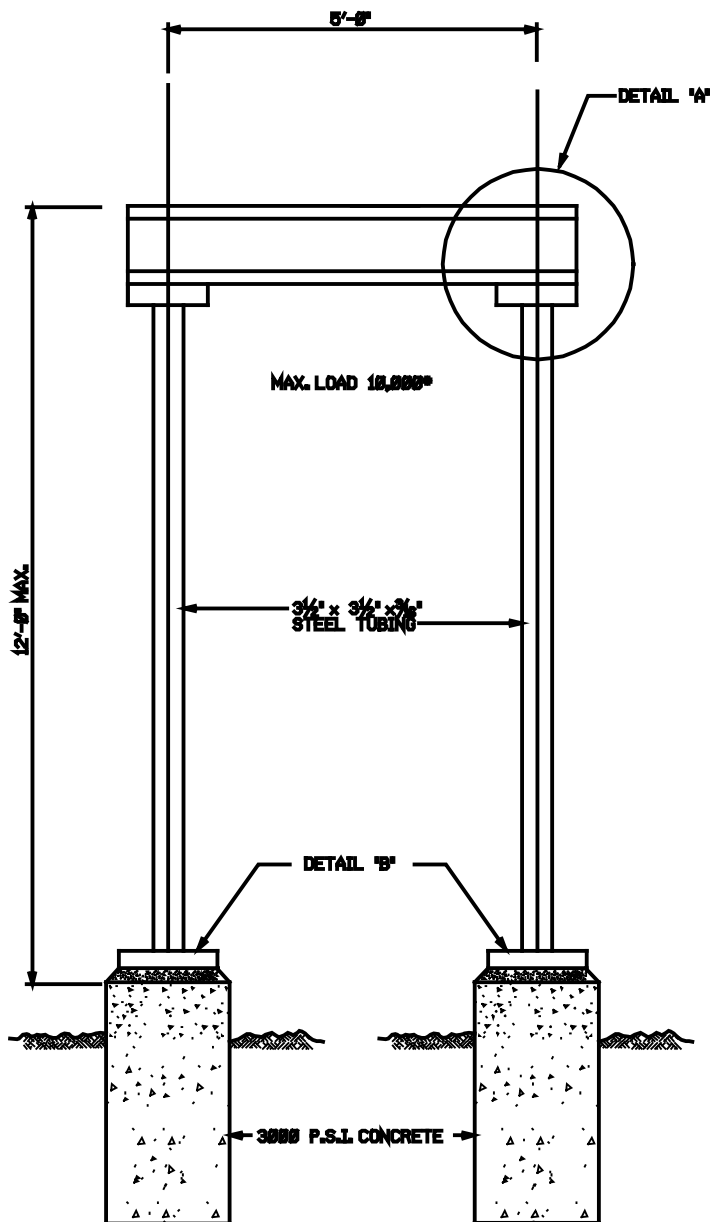
PIER - C

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PIPE HANGERS - BUILDING CONNECTIONS - BC SERIES

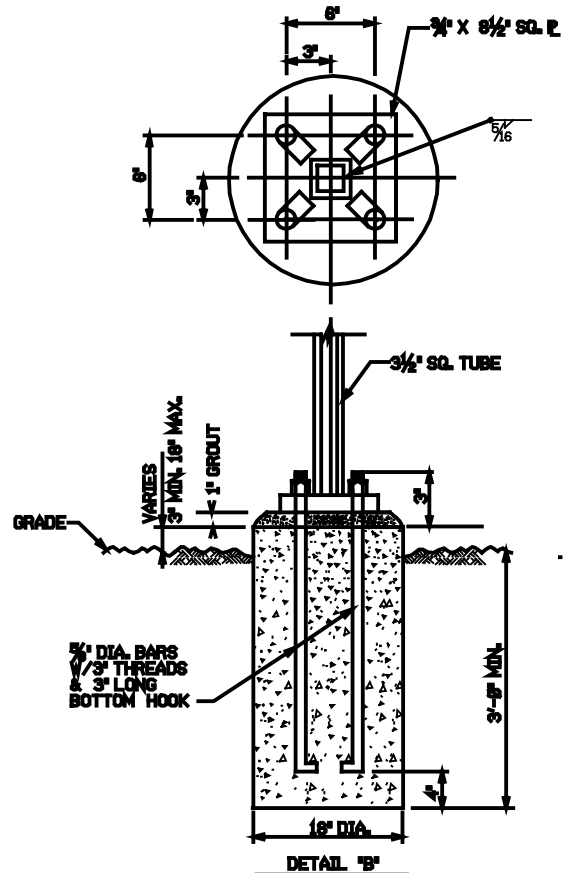
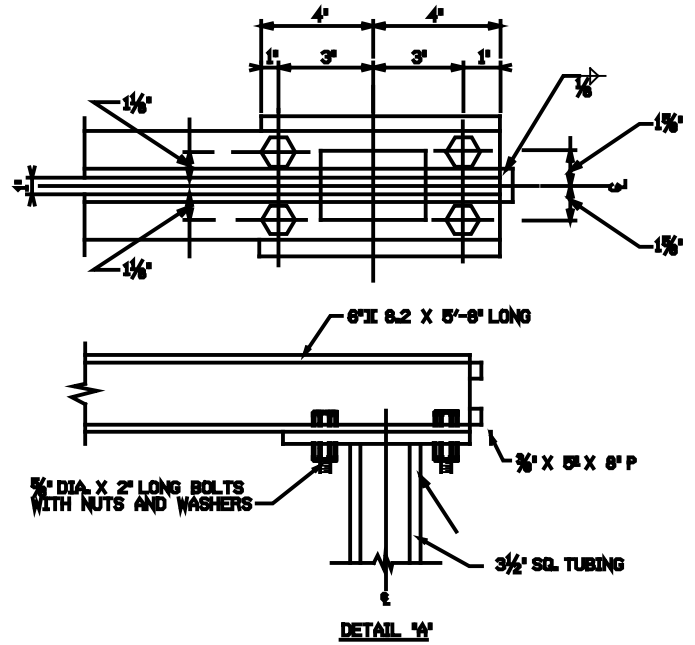


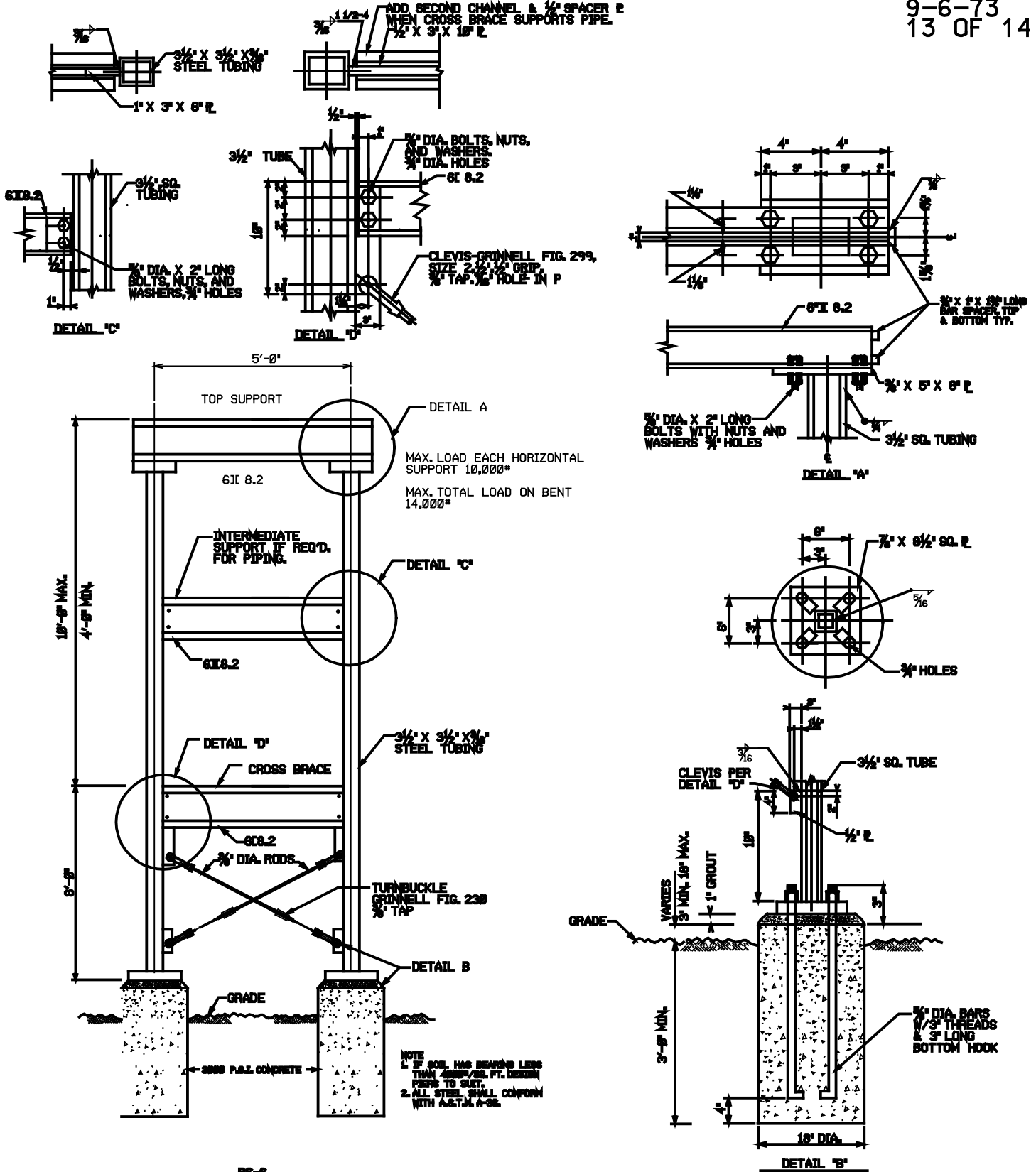
PIPE HANGERS - PIPE SUPPORTS - PS SERIES



PS-5

IF SOIL HAS BEARING LESS THAN 4000#/SQ. FT. DESIGN PIERS TO SUIT, ALL STEEL SHALL CONFORM WITH A.S.T.M. A-36.





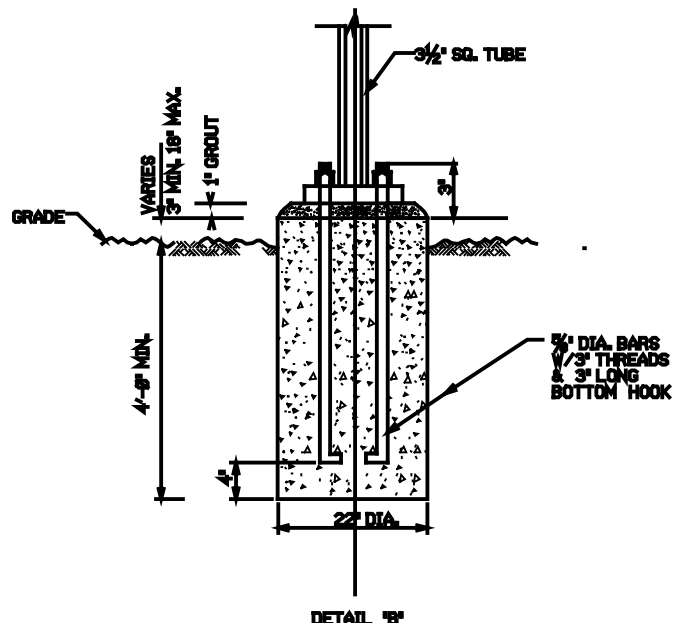
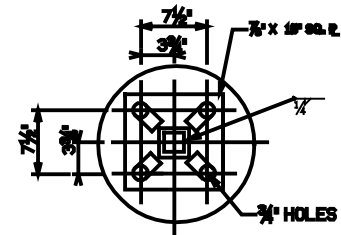
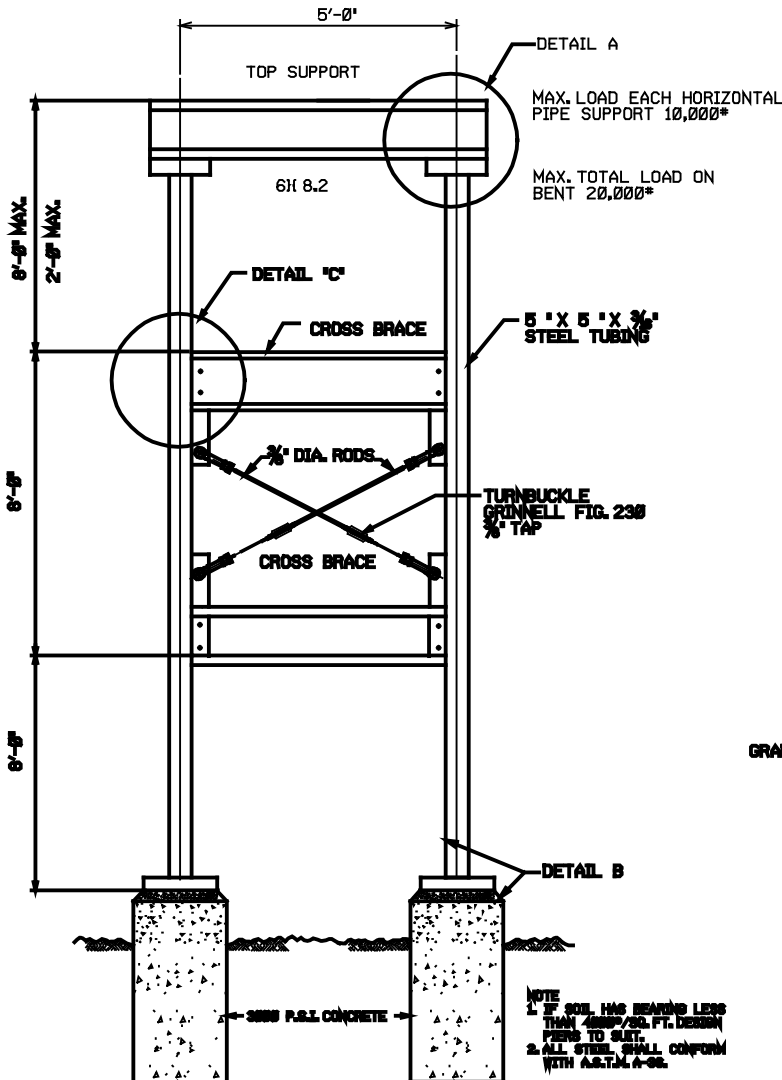
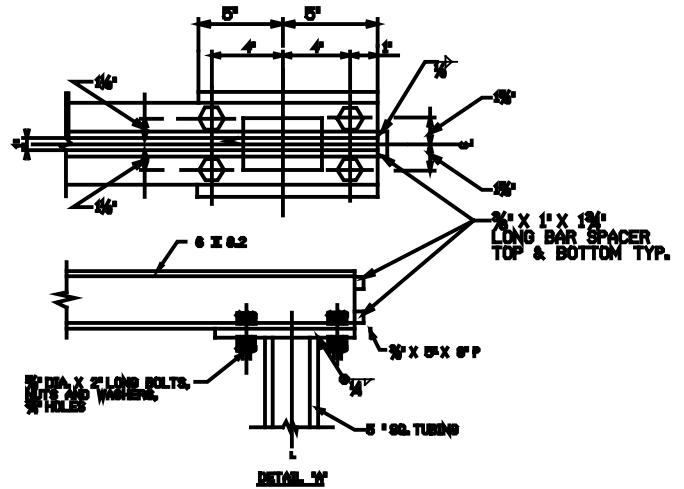
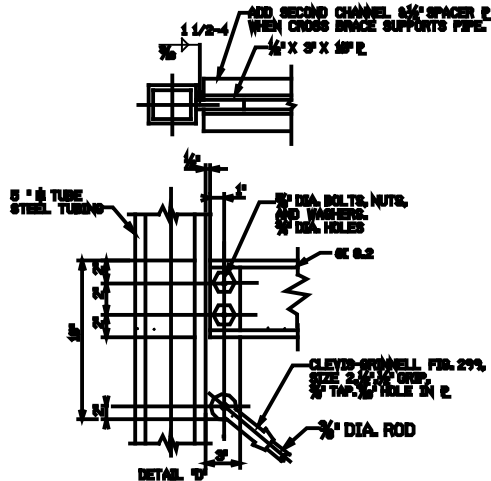
PS-6

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PIPE HANGERS - BUILDING CONNECTIONS - BC SERIES

PIPE HANGERS - PIPE SUPPORTS - PS SERIES

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